Patent claims

1. Device for generation of microwaves comprising of a coaxial virtual cathode oscillator with an outer cylindrical tube forming a cathode and connected to a transmission line for supplying the cathode with voltage pulses, and a inner cylindrical tube, at least partially transparent for electrons, forming an anode and connected to a waveguide for outputting microwave radiation generated by the formation of a virtual cathode inside an area enclosed by the anode, **wherein** the cylindrical tube of the cathode on the inside is equipped with a first electrically conductive structure transverse to the tube's longitudinal direction at a distance from the anode's, for the electron's at least partially transparent, tube and that the anode's, for the electron's at least partially transparent, tube on the outside is equipped with a second electrically conductive structure transverse to the tube's longitudinal direction at a distance from the cathode's cylindrical tube for creating resonant cavities in the virtual cathode oscillator.

2. Device as claimed in Patent Claim 1, **wherein** distance d_1 between the first electrically conductive structure arranged in the cathode's cylindrical tube and the anode's at least partially transparent tube is essentially determined by the generated microwave wavelength λ in accordance with the formula:

$d_1 = \lambda * n/4$, where n = 1, 3, 5, ...

3. Device as claimed in Patent Claim 2, **wherein** distance d_1 is essentially $\lambda/4$.

4. Device as claimed in any of the previous Patent Claims, **wherein** distance d_2 between the second electrically conductive structure arranged on the outside of the anode's, at least partially transparent, outer cylindrical tube and the cathode's cylindrical tube is essentially determined by the generated microwave wavelength λ in accordance with the formula:

$d_2 = \lambda * n/4$, where n = 1, 3, 5, ...

5. Device as claimed in Patent Claim 4, **wherein** distance d_2 is essentially $\lambda/4$.

6. Device as claimed in any of the previous Patent Claims, **wherein** the device comprises an adjustment mechanism for adjusting the distances d_1 and d_2.

7. Device as claimed in Patent Claim 6, **wherein** the adjustment mechanism can comprises a screw joint for axial offset of the first electrically conductive structure through rotation.

8. Device as claimed in Patent Claims 6 or 7, **wherein** the adjustment mechanism comprises of a screw joint for axial offset of the second electrically conductive structure through rotation.

9. Device as claimed in any of the previous Patent Claims, **wherein** the first and second electrically conductive structure essentially consists of aluminium.

10. Device as claimed in any of the previous Patent Claims, **wherein** the transmission line for feeding the cathode is connected to a high voltage generator.

11. Device as claimed in any of the previous Patent Claims, **wherein** the waveguide for outputting microwave radiation is connected to an antenna.

12. Device as claimed in Patent Claim 10, **wherein** the antenna is a horn antenna.

13. Device as claimed in any of the previous Patent Claims, **wherein** the anode is composed, at least partially, of mesh.

14. Device as claimed in any of the previous Patent Claims, **wherein** the anode is composed, at least partially, of a thin foil.